

Weight  
FRICTION FORCE < Static FRICTION FORCE  
KINETIC FRICTION FORCE  
NORMAL FORCE  
DRAG FORCE ✓  
TENSION FORCE  
LIFT FORCE

Weight  
measured  
in  
Newton's

FORCE PUSHING DOWN  
MASS + GRAVITY CONTRIBUTE  
TO IT

$$W = m g$$

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NORMAL FORCE

Perpendicular to SURFACE

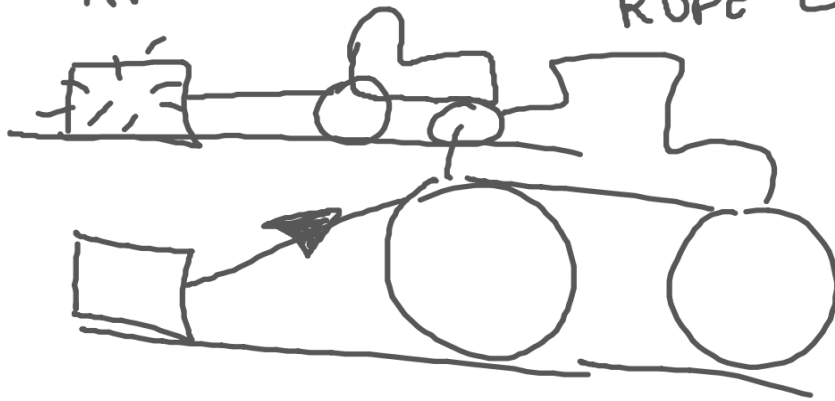
NO GROUND / NO NORMAL FORCE

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LIFT FORCE

DIRECTION is UP

TENSION FORCE  
PULL FORCE  
APPLIED BY ROPE OR CHAIN  
APPLIED IN DIRECTION OF  
ROPE OR CHAIN



FRiction FORCE  
STATIC FRICTION FORCE  
FROM STOP TO MOVING  
KINETIC FRICTION FORCE  
Keeping something moving

OPPOSITE OF DIRECTION of motion  
OR DIRECTION of Tension

CONTACT SURFACE  
NORMAL FORCE } Affects  $F_f$

$$F_f = \mu_s N$$

$$F_{fs} = \mu_s N$$

$\mu_s$  = coefficient of friction  
A function of Both  
CONTACT SURFACES

$N$  = NORMAL FORCE

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DRAG FORCE

SOLID ON A FLUID

LIQUID      GAS

## INTERNAL FORCES

FORCES THAT ARE  
INTERNAL TO THE OBJECT  
DONOT SHOW UP ON



FBD'S